

REMARKS

By the present amendment and response, independent claims 1 and 14 have been amended to overcome the Examiner's objections. Claims 1-24 are pending in the present application. Reconsideration and allowance of pending claims 1-24 in view of the following remarks are requested.

The Examiner has rejected claims 1-5, 7, 8, 10, 11, 14, 16, 18-22, and 24 under 35 USC §102(e) as being anticipated by U.S. patent number 6,204,728 to Johannes J. E. M. Hageraats ("Hageraats"). For the reasons discussed below, Applicant respectfully submits that the present invention, as defined by amended independent claims 1 and 14, is patentably distinguishable over Hageraats. However, Applicant believes that the present invention was conceived and reduced to practice prior to the effective filing date of Hageraats. As such, Applicant reserves the right to provide declarations and/or documents under 37 CFR §1.131 to "swear behind" the effective filing date of Hageraats.

Subject to Applicant's reserved right to establish priority of the present invention under 37 CFR §1.131, Applicant submits that the present invention, as defined by amended independent claim 1, teaches, among other things, a circuit comprising a bipolar transistor having a collector coupled to a source of a field effect transistor, "wherein said drain of said field effect transistor is not coupled to said base of said bipolar transistor by a feedback network," and "said bipolar transistor comprising a SiGe HBT." As disclosed in the present application, the present invention advantageously achieves an LNA having high gain, high linearity, and a low noise figure at low bias current without utilizing a

feedback network to couple the base of the SiGe HBT to the drain of the field effect transistor.

In contrast to the present invention as defined by amended independent claim 1, Hageraats does not teach, disclose, or suggest a circuit comprising a bipolar transistor having a collector coupled to a source of a field effect transistor, "wherein said drain of said field effect transistor is not coupled to said base of said bipolar transistor by a feedback network," and "said bipolar transistor comprising a SiGe HBT." Hageraats specifically discloses amplifier 10 having amplification stage 30, which includes FET 72 coupled to bipolar transistor 70 in a cascode configuration. See, for example, column 5, lines 59-62 and Figure 4B of Hageraats. In Hageraats, feedback network 40, which couples the base of bipolar transistor 70 to the drain of FET 72, comprises feedback capacitor C_F , which is selected to reduce IM3 intermodulation distortion at output 38 of amplifier 10 and to enable the input impedance of amplifier 10 to be easily matched with the output impedance of receiver 8. See, for example, column 4, lines 63-66, column 5, lines 6-16, and Figure 4B of Hageraats. In Hageraats, reduction of intermodulation distortion and ease of input impedance matching are two advantages of Hageraats's apparatus, e.g. amplifier 10. See, for example, Hageraats, column 3, lines 5-20. Thus, feedback network 40 is an essential circuit element, since it is utilized to achieve two stated advantages of Hageraats's apparatus, e.g. reduction of intermodulation distortion and ease of input impedance matching. As such, Hageraats requires a feedback network,

i.e. feedback network 40, which couples the base of bipolar transistor 70 to the drain of FET 72.

Additionally, Hageraats does not teach, disclose, or suggest utilizing a SiGe HBT in Hageraats's amplifier, e.g. amplifier 10. However, the present invention specifically utilizes and requires the advantages of a SiGe HBT. As disclosed in the present application, advances in SiGe BiCMOS technology have enabled the fabrication of SiGe HBTs having low noise figures. For example, a SiGe HBT may have a noise figure less than approximately 0.6 dB. As a result, by utilizing a SiGe HBT coupled to a field effect transistor to form an LNA (low noise amplifier), the present invention advantageously achieves an LNA having an overall low noise figure. Additionally, by utilizing a SiGe HBT coupled to a field effect transistor to form an LNA, the present invention advantageously achieves an LNA having high gain, high linearity, and a low noise figure at low bias current by using relatively inexpensive SiGe BiCMOS technology rather than much more expensive GaAs or InP technology. For the foregoing reasons, Applicant respectfully submits that the present invention, as defined by amended independent claim 1, is not suggested, disclosed, or taught by Hageraats. As such, amended independent claim 1 is patentably distinguishable over Hageraats. Thus claims 2-13 depending from amended independent claim 1 are also patentably distinguishable over Hageraats.

For reasons similar to those discussed above, the present invention, as defined by amended independent claim 14, is also not suggested, disclosed, or taught by Hageraats. As such, the present invention, as defined by amended independent claim 14, is also

patentably distinguishable over Hageraats. Thus claims 15-24 depending from amended independent claim 14 are also patentably distinguishable over Hageraats.

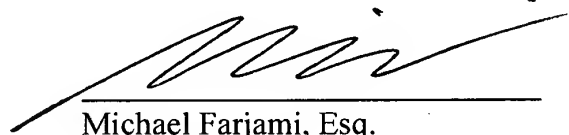
The Examiner has further rejected claims 6, 9, 13, 15, and 17 under 35 USC §103(a) as being unpatentable over Hageraats. As discussed above, amended independent claims 1 and 14 are patentably distinguishable over Hageraats and, as such, claims 6, 9, and 13 depending from amended independent claim 1 and claims 15 and 17 depending from amended independent claim 14 are, *a fortiori*, also patentably distinguishable over Hageraats for at least the reasons presented above and also for additional limitations contained in each dependent claim.

The Examiner has further rejected claims 12 and 23 under 35 USC §103(a) as being unpatentable over Hageraats in view of U.S. patent number 4,754,233 to Michael N. Pickett ("Pickett"). As discussed above, amended independent claims 1 and 14 are patentably distinguishable over Hageraats and, as such, claim 12 depending from amended independent claim 1 and claim 23 depending from amended independent claim 14 are, *a fortiori*, also patentably distinguishable over Hageraats and Pickett for at least the reasons presented above. For example, neither of the cited references Hageraats or Pickett teaches, discloses, or suggests a circuit comprising a bipolar transistor having a collector coupled to a source of a field effect transistor, "wherein said drain of said field effect transistor is not coupled to said base of said bipolar transistor by a feedback network," and "said bipolar transistor comprising a SiGe HBT."

Based on the foregoing reasons, the present invention, as defined by amended independent claims 1 and 14, and claims depending therefrom, is patentably distinguishable over the art cited by the Examiner. Thus, claims 1-24 pending in the present application are patentably distinguishable over the art cited by the Examiner. As such, and for all the foregoing reasons, an early allowance of claims 1-24 pending in the present application is respectfully requested.

Respectfully Submitted,
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Signature Date

Version with Markings to Show Changes Made

In the Claims:

Claims 1 and 14 have been amended as follows:

1. (Once Amended) A circuit comprising:

a bipolar transistor having a base, an emitter, and a collector, said bipolar transistor comprising a SiGe HBT;

a field effect transistor having a gate, a source, and a drain;

said base of said bipolar transistor being an input of said circuit;

said emitter of said bipolar transistor being coupled to a first reference voltage;

said collector of said bipolar transistor being coupled to said source of said field effect transistor;

said gate of said field effect transistor being coupled to a bias voltage;

said drain of said field effect transistor being coupled to a second reference voltage;

said drain of said field effect transistor being an output of said circuit,

wherein said drain of said field effect transistor is not coupled to said base of said bipolar transistor by a feedback network.

14. (Once Amended) A BiFET low noise amplifier comprising:

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a bipolar transistor having a base, an emitter, and a collector, said bipolar transistor comprising a SiGe HBT;

a field effect transistor having a gate, a source, and a drain;

an input of said BiFET low noise amplifier being coupled to said base of said bipolar transistor;

said emitter of said bipolar transistor being coupled to a first reference voltage through a first impedance circuit;

said collector of said bipolar transistor being coupled to said source of said field effect transistor;

said gate of said field effect transistor being coupled to a bias voltage;

said drain of said field effect transistor being coupled to a second reference voltage through a second impedance circuit, [and] said drain of said field effect transistor being coupled to an output of said BiFET low noise amplifier, wherein said drain of said field effect transistor is not coupled to said base of said bipolar transistor by a feedback network.